Facility Electrical Systems Inspection Checklist

SECTIONGENERAL PROVISIONS

1.0 PURPOSE

This document is used for annual inspections of electrical facility electrical distribution systems. It is the intent of this document to identify the relationship and expectation of the process of electrical inspections. The Electrical Inspection (EI) function is intended to support and enhance the Project Managers ability to deliver a safe product on time and on budget as well as provide electrical code review, surveillance, and compliance support to all Department of Defense (DoD) Offices, Branches, and Sections. Electrical Inspectors will collaborate with project managers to provide seamless and transparent support to the project optimizing both cost and schedule. In the event of a violation of the National Electrical Code (NEC) or a condition that compromises safety, life, or property, the Electrical Inspector shall make an assessment to stop operations. The Electrical Inspector will work expeditiously with Project Management to remedy the condition.

This document promotes the protection of the health, safety, and welfare of the personnel and occupants of the spaces at the Department of Defense by implementing reasonable safeguards and establishing specific requirements for the inspection, installation, and repair of electrical systems and equipment. This document is specific to the DoD and will be known as the EI Standard Operating Procedure for the Department of Defense.

2.0 ADOPTION OF STANDARDS

EI will enforce compliance to standards set forth by National Fire Protection Association, IEEE, and DoD in that order of increasing authority on DoD installations. The applicable standards shall be those revisions that were current at the time of project award, unless contracted otherwise. The National Electrical Safety Code as adopted by the Institute of Electrical and Electronics Engineers is made a part of this document. The NEC, including all annexes, as adopted by the National Fire Protection Association as NFPA 70, is incorporated by reference into, and is made a part of, this document. All electrical installations at the DoD will meet the standards and requirements set forth. as promulgated by the DoD and adopted by EI.

3.0 APPLICABILITY

No person may inspect, install, replace, or erect any kind of electrical wiring, raceway, conduits, or wiring to or repair of electrical elements or circuits of machinery and fixed or stationary appliances, motors, fixtures, signs, electrically operated heating equipment, elevators, or any other electrically operated apparatus or device in, on or about any premises at the DoD without having obtained a permit as required by DoD or having otherwise complied with these requirements, except:

> Any electric light or power company, railway company, telegraph or telephone company, or cable television company; or any persons performing electrical work for any such company when such work is a part of the plant or services used by the company in rendering its authorized services to the DOD or to businesses regulated by the Public Service Commission.

4.0 DEFINITIONS

Chief of Electrical Inspection Services - The Chief of the Department issuing electrical inspection permits and whose organization perform inspections. The Chief of Electrical Inspection Services' authority may be designated, in the Chief of Electrical Inspection Services' absence.

Code - The National Electrical Code (NEC), NFPA 70E, and any amendments pursuant to this chapter.

Cut In Card - The written authorization from an authorized Electrical Inspector to the Electrical Services Branch in order to connect power to an electrical system or to turn on the power distribution circuit.

Electrical Power Team - The body of electrical professionals consisting of the Chief of Electrical Inspections, Chief of Electrical Services, Electrical Technical Director *I* Chief Electrical Engineer, Division Chief of O & M, Division Chief of Project Execution or *their* designates who act in place of and on behalf of the Authority Having Jurisdiction (AHJ).

Electrical Work – Inspection, installation, replacement, alteration, addition. demolition, or erection of all or part of any electrical wiring, fixture, appliance, apparatus, raceway or conduit that generates, transmits, transforms or utilizes electrical energy for light, heat, power, or communications. Inspection is an implicit constituent of electrical work.

Master Electrician Unlimited - A person licensed by the State of Maryland to install, repair and maintain a particular appliance, apparatus, device or fixture in accordance with the NEC, including but not limited to electrical raceways, conductors, fixtures,

signs, motors, switchgears and distribution systems, fixed electrical heating/cooling systems or any other fixed electrical equipment or apparatus which conducts or consumes electricity.

Master Electrician Limited - A person licensed by the State of Maryland to install, repair and maintain a particular appliance, apparatus, device or fixture in accordance with the NEC, limited to branch wiring for automatic heating furnaces whose principal operation is derived from fuel oil, gas, steam or coal; refrigeration and air conditioning equipment; illuminated signs; elevators; x-ray machines and similar specialties.

Shelved Master Electrician – A person licensed by the State of Maryland to maintain an inactive Master Electrician license.

Inspection - A process by which a review of the installed electrical work occurs by an Inspector after an authorized permit has been issued by EI to an electrical contractor

Inspection Certificate - The certificate of inspection issued by the inspector indicating that the installation is in conformity with the NEC. Copies of the certificate are required to be forwarded to the DOD Project Manager and the contractor or their agent prior to use or occupancy of the structure.

Inspector - An individual employed by the government who is authorized or recognized through the EI and has been approved by the Chief of EI and the Electrical Power Team (AHJ) to perform electrical inspections. An inspector may also be an individual who is hired by the Government who meets the requirements of the specific job description for the purpose of performing inspections with a single focus or who is limited to a specific project or projects.

Permit - An application to do electrical work at the DOD that has been filed with and approved by EI.

Standard Operating Procedure -Department of Defense implementation of the abbreviation SOP.

5.0 CODE

All electrical work shall be guided by safety, including the National Fire Protection Association electrical safety code, NFPA 70E. The NEC is adopted by the DOD for the purpose of establishing rules and regulations for the installation, renewal, extension and reception of electrical wiring and electrical apparatus in existing buildings, structures or outdoor electrical displays and signs, or in the construction, reconstruction alteration or repair of buildings, structures or outdoor electrical displays or signs, that certain code known as the "National Electrical Code", as recommended

by the National Fire Protection Association, being particularly the current edition thereof and the whole thereof, herein after referred to as the NEC, and the same is recognized and used by the DOD and from the date on which the NEC takes effect. The provisions thereof and all amendments thereto will be controlling for all existing and future electrical wiring and apparatus in buildings, structures or outdoor electrical displays or signs within the control of the DOD.

6 through 10 Reserved

SECTION II – AUTHORITY HAVING JURISDICTION

11 through 15 Reserved

16.0 JUDGMENTS

All installed inspections shall be performed by the NEC and the approved project documentation. The hierarchy of installed inspection judgments rising authority shall be the person(s) responsible for performing the work, the inspector, the Government's project electrical engineer, the Government project management, and then Chief of EI. The judgment is in force, unless it is revised by AHJ.

17.0 APPEALS

Any person affected by any decision made in connection with the enforcement of any judgment provision may request and may be granted a hearing before the AHJ and the Chief of EI or his designee.

The appellant shall apply for a hearing on any order, notice or decision from which they are affected or which they feel was unreasonable. The appellant in any matter shall have the burden of proof and shall also be responsible for any cost incurred.

18 through 19 Reserved

SECTION III-ADMINISTRATION

20.0 PERMIT REQUIRED

A) In the case of any electrical installation for which a permit is required under this chapter, it will be considered as non-compliance for any person to maintain or allow to be maintained such installation if it was installed without a permit and/or does not conform to the requirements of this chapter. The circuit may be subject to being deenergized or the circuit(s) may not be energized until compliance is satisfied or another remedy is agreed upon, except:

No permit will be required to repair portable electrical equipment, or lighting

fixtures. lo repair or replace sockets, receptacles or snap switches, or make other minor repairs al existing outlets, or to replace motors with motors of the same horsepower rating. The motor-for-motor replacement will be like-for-like replacement.

B) Any person permitted to install electrical work must first secure a permit to do so from EI before starting any such work. Upon notification to EI, jn cases of emergency they may proceed without permits, inspections and approval but will acquire all such approvals within a reasonable time.

C) In the case of any existing electrical installations, it will be required for these installations to be maintained in a safe condition and where hazards exist the condition must be presented to the Government and it is the responsibility of the Contractor to gain or amend the necessary permits to correct such hazardous and DoD conditions in accordance with the NEC.

D) Where the master electrician who was originally issued a permit is removed from the work by the owner and is being replaced by another master electrician, the owner will notify the Government Project Manager, in writing of the proposed change. A new permit may be issued and at this time the new master electrician shall be required to sign documentation assuming responsibility for the work for the entire project.

21.0 PERMITTING

A) Deenergized circuits shall comply with Lock Out / Tag Out (LOTO) procedure, thus the person who implemented the LOTO must be present at the Inspection.

B) EI shall approve, store, maintain, and close the Inspection permits.

C) The electrical contractor shall display a copy of the Inspection permit, during electrical installation.

22.0 LICENSING

A) There are three classes of Master Electrician licenses as defined in Section 4 of this chapter:

1) Unlimited

2) Limited

3) Shelved

B) No contractor or person may install or erect any kind of electrical wiring, raceway, conduits, or wiring to or repair of electrical elements or circuits of machinery and fixed or stationary appliances, motors, fixtures, signs, electrically operated heating/cooling equipment, elevators, or other electrically operated apparatus or device in, on or about any premises of the DOD without possessing or being under the supervision of one who possess, an active State of Maryland Master Electrician license and obtained a permit as required by the DOD, except:

1) Utility company regulated by the Public Service Commission of Maryland when working on the line side of a meter.

2) Radio and television transmitting stations licensed and commissioned by the Federal Communications Commission regulations.

23.0 INSPECTIONS AND APPROVALS

A) Upon the completion of any installation of electrical equipment that has been made under a permit, it shall be the duty of the person, firm, or corporation making the installation to notify the Government Project Manager who will notify EI *I* Inspector, which will inspect the work stated in the schedule or agreed to with the Government Project Manager.

B) Certification of the electrical installations is required within 15 days after completion, and each such installation will be certified by EI / Inspector.

C) When any portion of an electrical installation within the jurisdiction is to be hidden from view by the permanent placement of parts of the building, the person, firm or corporation installing such equipment shall notify EI / Inspector, and such equipment shall not be concealed until it has been inspected. Where the concealment of equipment proceeds continuously, the person, firm or corporation installing the equipment shall give EI *I* Inspector due notice in advance and inspections shall be made periodically during the progress of the work.

D) Any concealment of electrical work or proceeding without the proper inspections may result in the stoppage of work and/or opening or exposing the work for inspection at the direction of the Government Project Manager or the Contracting Officer. The removal of such parts of a building to inspect the work properly will be required to perform the proper inspections. All costs and schedule delays incurred by the Government, Government's agent, construction contractor, or construction subcontractor shall be the expense of the party responsible for the concealment or order to proceed.

E) Upon inspection if any installation is found not in conformity with the applicable electrical codes and any other rules, regulations or ordinances. The Inspector making the inspection will at once forward to the project manager, person, firm or corporation making the installation a written notice stating the defects that have been found to exist. The contractor will upon receipt of notification immediately make the repairs and correct the violations.

F) At any stage of approval or denial of the installation (rough, final, etc.,), the Inspector will place/post in a conspicuous location on the property or structure a sticker or similar indicator that the job has been either approved or disapproved.

G) Where the Inspector finds the installation to be in conformity with all applicable local ordinances and all rules and regulations, the Inspector will issue to the project manager, person, firm or corporation making the installation a certificate of approval, with a duplicate copy for delivery to the owner, authorizing the connection to the supply of electricity and will send written notice of such authorization to the Electrical Services Branch.

H) When a temporary approval is issued authorizing connection of an installation, the certificate of approval will be issued to expire at a time to be determined therein and will be revocable by the Inspector with the approval of the Chief of EI for just cause.

24.0 EMERGENCY INSPECTIONS

Whenever in the judgment of the Government, OHESS (Occupational Health, Environmental, and Safety Services), Local Fire Chief or Incident Commander or their designee, there exists a potential situation which requires the inspection by the EI or an Inspector; an inspector will be called from the list of Inspectors posted by EI.

25.0 INSPECTORS

This SOP requires an individual to obtain written approval from the Chief of EI, to be an Inspector. An Inspector shall be required to demonstrate knowledge and experience in the codes and standards that are applicable to the electrical work being inspected.

26 through 27 Reserved

28.0 CUT-IN CERTIFICATES

No electrical power will be provided to circuits or equipment unless it was installed under the supervision of a Master Electrician licensed by the State of Maryland and

until a temporary or permanent cut-in certificate has been issued by the EI or an Inspector and sent to the Electrical Services Branch to turn on power to the circuit. Any temporary or permanent cut-in certificate may be revoked by the A H J upon presentation to the A H J of sufficient evidence that continued use of electrical energy will or could result in risk to life, persons, or property.

29.0 RIGHT OF ENTRY

When it is necessary to make an inspection to enforce the provisions of the NEC, or where the Inspector has reasonable cause to believe that there exists in a structure or upon a premises a condition which is contrary to or in violation of this code which makes the structure or premises DoD, dangerous or hazardous, the Inspector is authorized to enter the area at reasonable times to inspect or perform the duties imposed by this SOP.

30.0 VIOLATIONS AND COMPLAINTS

A) Where any equipment is determined by the Inspector to be an immediate threat to the safety of persons or property, the Inspector upon consulting with the Chief of EI and the Government Project Manager will have the authority to render the electrical equipment safe or to be disconnected immediately without prior notice to the Contractor.

B) When a violation occurs or a complaint is received, such complaint/violation will generate a report, which is forwarded to the Chief of EI or his designee. Upon receipt of the complaint/violation report, the Chief or his designee will contact one of the Inspectors and request that an investigation be performed.

C) Whenever the Inspector determines that there has been a violation of the NEC or has reasonable grounds to believe that a violation has occurred, a copy of the violation will be forwarded to the Chief of EI or his designee who will take the appropriate action necessary to resolve the complaint / violation.

D) Notice will be given to the Contractor and party responsible providing specific information and code criteria in regards to the violation and will give a specific time in which the said violation will be resolved.

31.0 PENALTIES

Reserved

32.0 DENIAL, RESCISSION, WITHDRAWAL AND OR SUSPENSION OF PERMITS

A) At any time that the Inspector determines that an electrical contractor has

installed. repaired maintained or erected any kind of electrical wiring, raceway, conduits, or wiring to or repair of electrical elements or circuits of machinery and fixed or stationary appliances, motors, fixtures, signs, electrically operated heating/cooling equipment, elevators, or other electrically operated apparatus or device in, on or about any premises at the DOD in violation of the NEC, notice will be sent to Project Manager advising them of the violation.

B) For the purposes of this section, "electrical contractor" will be defined to mean the party to whom the electrical permit for the building/installation not in compliance was issued and will also include any party actually performing the work of construction/installation upon the building/project. The electrical contractor will also include any officer of any corporation, any partner of any partnership or any related corporation, partnership, limited liability company or limited liability partnership owned in whole or in part by any aforementioned party.

C) While any violation is in effect and has not been rectified to the satisfaction of the Chief of Electrical Inspections, his designee, or the Inspector, all permits related to the project for which the violation exists also may be suspended, denied, withdrawn or rescinded.

Electrical Inspector - Work Role

1. Summary

The Electrical Inspector will be able to conduct technical inspections of work to ensure compliance with local ordinances and National Electrical Code (NEC) articles covering the installation and operation of electrical systems and equipment. Employee will normally work independently on field inspections, making decisions requiring the use of technical judgment and discretion. Employee will consult with the Chief of Electrical Inspection Services on unusual cases. Performance evaluation is based on review of reports and spot inspections.

2. Specialized Tasks

The work of the Electrical Inspector may consist of, but is not limited to, the following:

Conduct inspections of new electrical installations in business, public, and/or industrial buildings for conformance with safety standards, local ordinances, and NEC requirements.

l. Review daily inspection work schedules and prepare work assignments and overtime authorization.
2. Conducts plan review prior to construction. Resolves non-compliance with approved plans and specifications; works with design professionals and trades people to resolve issues.
3. Conduct pre-construction meetings with design professionals and trades people; resolve issues that may conflict with other agencies and/or offices.
4. Conduct inspections of existing wiring installations of vacated buildings prior to reconnection to the main power circuit.
5. Audits licensure and qualifications of electricians working at DoD meet requirements as determined by Authority Having Jurisdiction (AHJ).
6. Conduct field inspections to audit contractor's workmanship and quality of construction;
7. Coordinate installation and/or relocation of utilities with local utility provider.
8. Conduct investigations of handles complaints on projects which are under DoD inspection and determines resolution of complaints.
9. Inspect generating equipment for safety compliance.
10. Prepares reports and maintains records of work performance.
11. Performs the functions of the Chief of Electrical Inspection Services during that individual's temporary absence.
12. Conducts final inspections for assigned projects.

3. Specialized Competencies:

The Electrical Inspector shall demonstrate a thorough knowledge of the

following:

1. Methods and practices involved in constructing, installing, maintaining and operating electrical installations and equipment.
2. Possible defects and flaws in electrical wiring and equipment.
3. Standard testing devices and of effective corrective measures.
4. NEC (and other pertinent) standards relating to complex electrical installations and equipment.
5. Ability to detect and locate defective electrical wiring and construction when defects are easily accessible and remedied.
6. Ability to understand and work from construction and wiring drawings and diagrams.
7. Ability to establish and maintain effective working relationships with building owners, contractors, and craftsmen.
8. Ability to enforce ordinances and other regulations with firmness, tact and impartiality.
9. Ability to train inspectors with less experience in the objectives and techniques of electrical inspections.
10. Applicable safety codes: 29CFR1910.300-399, 29 CFR 1910 269, NFP 70E, NETA ATS, and NETA MTS.

4. General Competencies

The Electrical Inspector shall

l. Possess a high school diploma, vocational-technical school diploma, or GED certificate.
2. Have completed an Electrical Apprenticeship Program recognized by the applicable State or licensing authority.

5. Licenses:

The Electrical Inspector shall possess a Journeyman Electrician license and a Master Electrician's License recognized by the applicable State or licensing authority.

6. Certificates

N/A

7. Physical Requirements

The Electrical Inspector shall be able to comply with the following physical requirements:

- Rapid mental and muscular coordination simultaneously;
- Climbing, legs only and legs and rums (hours);
- Crawling (hours);
- Depth perception;
- Hearing (aid permitted);
- kneeling (hours);
- Moderate carrying 15-44 pounds;
- Reaching above shoulder;
- Standing (hours)
- Use of fingers;
- Walking (hours);
- Repeated bending
- Specific visual acuity

8. Environmental Factors

The following environmental factors may be encountered:

- Constant and/or excessive noise
- Degraded air quality (dust, fumes, smoke, gasses)
- Electrical and/or radiant energy
- Temperature extremes
- Slippery and/or uneven walking surfaces
- Working around machinery with moving parts
- Working around moving objects or vehicles
- Working below ground
- Working on ladders, scaffolding, or elevated surfaces

9. Required Safety Equipment:

The electrical inspector shall require Safety glasses, a hard hat, protective clothing, a respirator; safety shoes, and hearing protection that are rated for electrical environments. An employee in this work role must meet the requirements of an Electrical Qualified Person as defined by:

- CFR 1926.32(1), which states: "Qualified" "means one who, by possession of a recognized degree, certification, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his (her) ability to solve or resolve problems relating to the subject matter, the work, or the project",
- CFR 1910.331(a) "those who have training in avoiding the electrical hazards

of working on or near exposed energized parts",

- NFPA 70E Article 100. In compliance with OSHA 29 CFR I 910.331-335 Electrical safe work practices for qualified persons. This applies to employees working on electrical work where electrical hazards exist on systems <600VAC/DC and >600VAC/DC.

10. Work Role Minimum Qualifications

10.1. Entry Level

- Entry is 5 years experience as a Master electrician.

10.2. Full Performance

- Entry is 10 years experience as a Master electrician

10.3. Senior

- Entry is 15 years experience as a Master electrician
- Licensed by applicable State or licensing authority as Electrical Inspector.

10.4. Expert

- Entry is 20 years experience as a Master electrician
- Licensed by applicable State or licensing authority as Electrical Inspector.
- Associate's degree in Electrical Technology, Electronics Technology, Associate of Applied Science in Electrical Engineering, or related field

10.5. Supervisor

- Ability to meet Senior qualifications.
- Management experience.
- Working knowledge of MS Office.

Electrical Permit Application

JOB INFORMATION			
BUILDING		FLOOR	SUITE
PTN		PROJECT MANAGER	
WORK DESCIPTION			

CONTACT INFORMATION			
CUSTOMER		CONTRACTOR	
NAME		NAME	
PHONE		PHONE	
BUILDING		LICENSE	
FLOOR			
SUITE			

ITEMS INSTALLED REQUIRING INPECTION					
DESCRIPTION	QTY	RATING	DESCRIPTION	QTY	RATING
SERVICE ENT.			PUMP		
SERVICE ENT.			PUMP		
SERVICE ENT.			PUMP		
SERVICE ENT.			FAN		
SUB FEED			FAN		
SUB FEED			FURNACE		
SUB FEED			BOILER		
SUB FEED			HEAT PMP		
SUB FEED			NC		
SUB FEED			MOTORS		
CON TR. SER			MOTORS		
MANHOLE			MOTORS		
RGH. SWITCH			MOTORS		
RGH. RECPT.			ELEVATOR		
FIXT. INCAND.			XFMER		
FIXT. FLOUR.			XFMER		
FIXT. HID.			XFMER		
FIXT. LED.			XFMER		
RANGE			LS GEN.		
OVE			LS GEN.		
OVEN			SB GEN.		
COOK TOP			SB GEN.		

Electrical Permit Application

COOKTOP			AIRCOMPR.
DRYER			AIRCOMPR.
DRYER			AIR HANDR.
WTR. HTR.			AIR HANDR.
WTR. HTR.			AIR HANDR.
DISH WSHR.			REFRG EQUIP.
DISH WSHR.			
DISPOSAL			UNDERFLR
			POLE BASES

INSPECTION LOG AND COMMENTS